CHAPTER 1: INTRODUCTION

The goal of the Soils Technical Report is to present the potential impacts from the coalbed methane (CBM) extraction process on land and the environment. This report pertains to options for water disposal or reuse that might affect land. The main focus is on impacts to agriculture, including potential effects on crops, livestock, and soils. The predominant land use in the project area is for agriculture, with ranching being the main agricultural use of the land.

1.1 BACKGROUND

Coalbed methane is a carbon-based gas that occurs naturally in large quantities in the seams in unmined coalbeds. The CBM is typically contained within the micropores of the coal and is retained in place by the pressure created by the presence of water. During production, this water is pumped to the ground surface to lower the pressure in the coalbed reservoir and to stimulate the release of methane from the coal.

Methane from unmined coalbeds has been produced on a minor scale since the early 1900s when a rancher in the Powder River Basin (Wyoming) drilled a water well into a coalbed and started heating the buildings with the produced gas. Until the 1980s, coal seams generally were not considered to be a reservoir target, even though producers often drilled through coal seams when going to deeper horizons.

The Powder River Basin in Montana and Wyoming is one of the most active new areas of CBM production. Currently more than 3,000 producing wells are in the Wyoming portion of the Basin and the U.S. Bureau of Land Management (BLM) in Wyoming is preparing to estimate the impact of as many as 30,000 CBM wells (Regele and Stark 2000). CBM production is currently greater than 333,000 million cubic feet per day (mcf/day) and the accompanying water production is more than 1.28 million barrels per day (124 ac-ft/day).

CBM gas production is already underway in Montana and development similar to that in Wyoming appears likely. The Montana Board of Oil and Gas Conservation (MBOGC) has issued about 290 permits to drill CBM wells in the state with about 120 wells having been drilled on non-Federal lands near Decker (Regele and Stark 2000). All of the water that is discharged by these wells flows toward or directly into the Tongue River and its tributaries. The Tongue River and the Powder River in Montana are two drainage areas that are of immediate interest for CBM development.

As the number of CBM wells increases, the amount of water produced will also increase. Although water production from a CBM well typically declines over the life of the well, the decline in water production in the basin as a whole is not expected to occur until most of the CBM wells have been developed and produced for a number of years. One of the alternatives to river discharge is discharge or reuse onto land. This will be the main subject of this report.

1.2 REGULATORY RESPONSIBILITIES

The landspreading of CBM water, because of its source and quality, comes under the jurisdiction of the Montana Department of Environmental Quality (MDEQ). The governor of Montana recently directed Montana agencies, with MDEQ and MBOGC as the lead agencies, to carry out a review of anticipated CBM activity (Regele and Stark 2000). Any environmental document produced by the review will delineate the CBM-related responsibilities of each agency and the resources that CBM development affects. While specific regulatory requirements for the use of CBM water are not addressed in this Technical Report, it should be understood that any suggested use of CBM water would have to satisfy the requirements of the Montana Environmental Policy Act and any specific requirements of MDEQ.

1.3 STUDY AREA FOCUS

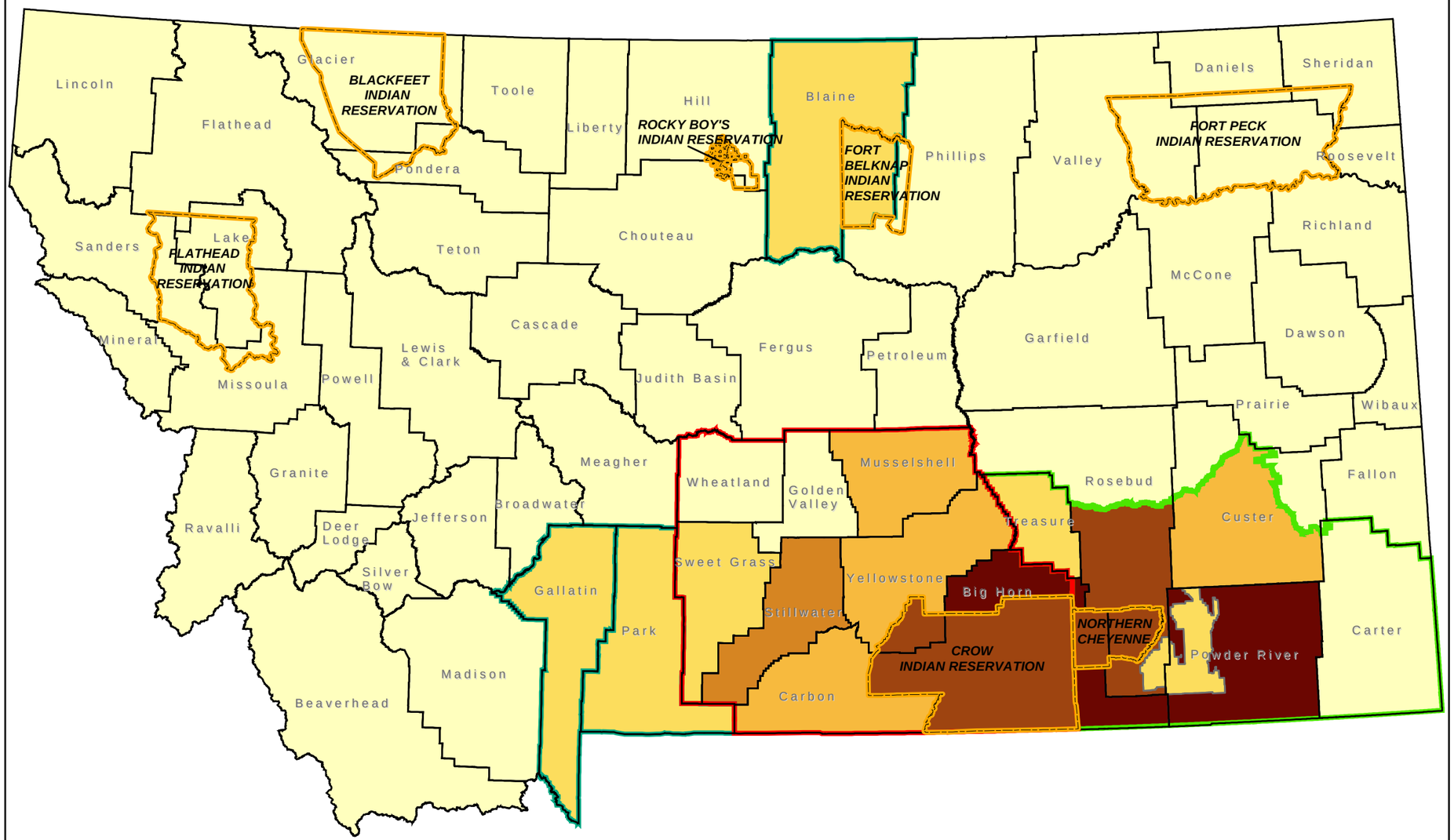
This Technical Report is an appendage to the Montana Statewide Oil and Gas Environmental Impact Statement (EIS) and Amendment of the Powder River and Billings Resource Management Plans (RMPs) to be released in 2001. The EIS covers the state of Montana, with an emphasis on the BLM's Powder River Resource Management Area (RMA), Billings RMA, and three isolated areas in Blaine, Park, and Ga llatin counties (Exhibit 1). In the Reasonable Foreseeable Development (RFD) for Montana, the BLM estimates the potential CBM wells statewide in the next 20 years to be from 10,000 to 26,000 wells (BLM 2001). As shown in Exhibit 1, the Powder River and Billings RMAs represent the bulk of the potential CBM development in Montana with a minimal number of wells being predicted in the other three counties. Because of the concentration in these two areas, this Technical Report will focus only on the Powder River and Billings RMAs. Conclusions for other areas of the State can be inferred from this study.

1.4 PURPOSE

From previous studies, it is known that CBM water is typically of lower quality than surface water or other groundwater. Because of this, the use of CBM water for irrigation or other agricultural uses may result in some degree of negative impacts to the soils and the crops grown in the soils. These impacts may have to be mitigated if CBM water is to be used in area agriculture for irrigation, livestock, and other uses.

This Technical Report presents a general characterization of CBM water, discusses the potential for use of the water in agriculture, suggests the potential impacts of its use or disposal on land, and presents an analysis of the findings.

Exhibit 1: RFD CBM Development



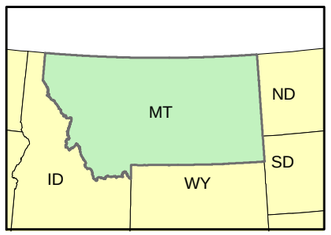
Legend

- Billings RMP Area
- Powder River RMP Area
- Special Consideration Counties
- Native American Reservations

Number of CBM Wells

- 0
- 1 - 100
- 101 - 400
- 401 - 700
- 701 - 4,000
- 4,001 - 7,000

This map shows the maximum number of CBM wells as described in the Reasonable Foreseeable Development Scenario. NOTE: The majority of development for Big Horn county will be located in the southern portion.



Location Map

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N W E S

1:3,000,000

50 25 0 50 Miles

50,000 25,000 0 50,000 100,000 Meters

DATA SOURCES:

Counties: 1:100,000 scale, counties, Montana State Library/NRIS, Helena, Montana.
Reservations: 1:100,000 scale, reservations, Montana State Library/NRIS, Helena, Montana.
Development Data: BLM Reasonable Foreseeable Development Scenario